

# A PRELIMINARY LIST OF THE LICHENS OF CENTRAL MISSOURI, WITH ECOLOGICAL NOTES

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This investigation was started at the University of Missouri as a preliminary list of the lichens of Boone County, Mo. At the Henry Shaw School of Botany it was extended to include nine other counties, and was conducted as a graduate research problem under the direction of Dr. C. W. Dodge. I am indebted to Dr. G. T. Moore for the facilities afforded by the herbarium and the excellent lichen library of the Missouri Botanical Garden. I am further indebted for the many courtesies extended by the staff; and especially to Dr. C. W. Dodge for helpful advice.

The nomenclature used in this paper is that of Fink,<sup>1</sup> except for the family Teloschistaceae, where that of Hillmann<sup>2</sup> was followed. No attempt is made to settle questions of nomenclature or to give synonymy. Permanent slides of sections through the apothecia and thalli were made, and the determinations of the species checked with authentic herbarium material when this was possible. A duplicate set of specimens has been deposited in the Herbarium of the Missouri Botanical Garden.

At the time the collections were made complete notes were taken of the ecological relation and habitat of each species. Lichens respond readily to any change in environment. The effect of sunlight on their abundance and fertility is notable. In the heavily wooded sections of the area studied, species belonging to the families Parmeliaceae, Physciaceae, Caloplacaceae, Graphidaceae, and Teloschistaceae are rare and usually

<sup>1</sup> Fink, Bruce. The lichen flora of the United States. Completed for publication by J. Hedrick. Ann Arbor, 1935.

<sup>2</sup> Hillmann, von Johannes. Teloschistaceae. In L. Rabenhorst's *Kryptogamen-Flora* 9: 6. Abt. Lief. 1. 1935.

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sterile when they inhabit bark. The same species are very abundant and usually fertile when growing on trees of partly cleared fields or wooded pastures in the same neighborhood. Sunlight rather than moisture seems to be the chief factor in their development. The influence of sunlight on both fertility and development of the yellow pigment is definitely shown in *Xanthoria parietina* and *Caloplaca microphyllina*. Where these lichens partly encircle a tree they will be bright yellow on the south side of the tree and green on the shaded side, demonstrating their inability to form the lichen-acid parietin in reduced sunlight. *Dermatocarpon miniatum*, *Pannaria rubiginosa* var. *lanuginosa*, and *Sticta quercizans* are species in which the amount of moisture is more nearly a limiting factor than the amount of sunlight. *Dermatocarpon miniatum* is one of the lichens occurring in each of the counties studied. It always grows attached to rocks in moist shaded places, and in a few instances it has been collected on the north face of a bluff where the light of the sun never reaches it.

The harmful effect of the gases of coal smoke on lichens is well known, but they are also injured by the gases from wood smoke even in relatively small amounts. In many of the wooded pastures, where it is the common practice to burn off the covering of leaves and dead grass during the early spring, lichens are definitely rarer and much less well developed than in adjoining areas which are not subject to burning. The injury could not be due to heat, except to lichens on the ground or on the bases of the tree trunks, for these fires are never large. Moreover, species like *Parmelia Borreri*, *P. rudecta*, and *Physcia astroidea* which normally form associations reaching from ten to fifteen feet above the surface of the ground, show definite injury.

The most favorable locality in this region for finding fertile species has been the wooded bluffs of the larger streams. These bluffs naturally furnish a variety of light and moisture conditions and also are little grazed by stock, and are well removed from the destructive influences of smoke. The stability of the substrate also determines to a large measure the abundance of the lichen flora. Crumbling stones, trees which



shed their bark in small flakes or granules, and loose soil furnish a poor habitat. Many of the saxicolous lichens show a definite preference for certain types of rocks. There is no evidence that lichens prefer any particular species of tree. Those found on soil that has recently been disturbed are of the rapid-growing kind, like *Cladonia pyxidata*.

The principal habitats of lichens in this area, together with their associations, have been noted under the eleven groups which follow:

#### CHERT AND FLINT ROCKS

Boone, Cole, Gasconade, and Washington Counties have many localities where erosion has removed the less resistant materials and left chert and flint rocks exposed. These rocks furnish a substrate suitable to a few species of lichens and are the only rock substrate which is not observably penetrated or marked by the hyphae or rhizoids of the lichen. The lichens found on flint and chert are: *Acarospora citrina*, *Parmelia Borreri*, *P. hypotropa*, *P. saxatilis*, *Dermatocarpon miniatum*, *Rhizocarpon geographicum*, and *R. concentricum*. However, there were so few that they could hardly be referred to as an association.

#### SANDSTONE LEDGES AND ROCKS

In scattered localities throughout each of the counties studied sandstone appears as isolated outcrops and ledges. When the sandstone is soft and easily weathered it supports a very meager lichen flora. When the matrix cementing the quartz grains is of calcareous material, the hyphae of the lichen may penetrate the surface of the stone to a depth of two centimeters. This is particularly noticeable with *Parmelia saxatilis*. When the matrix is an iron oxide there is but little penetration of the surface of the stone, but the solid surface supports a more varied lichen growth. Associations on sandstone are: *Parmelia saxatilis*, *P. Borreri*, *P. hypotropa*, *P. rudecta*, and *Lecidea turgidula*. *Parmelia saxatilis* usually dominates the association and at times crowds out the other species.



## LIMESTONE LEDGES AND ROCKS

Limestone is the most common type of rock in this region. There is hardly a locality without its appearance as bluffs, ledges, or loose rock. It supports a more varied lichen flora than any other substrate except the bark of living trees.

There are two very definite associations of lichens found on limestone: the bluffs of rivers and larger streams, and ledges in dry upland woods. The association for the bluffs is: *Lecanora muralis*, *L. melanophthalma*, *Acarospora glaucocarpa*, *Lecidea cinnabarina*, *L. auriculata*, and *L. perproxima*, with *Lecanora muralis* dominating.

The ledges in dry upland woods usually have *Parmelia saxatilis* as a dominant. The association is: *Parmelia saxatilis*, *P. caperata*, *P. rudecta*, *Physcia lithotodes*, and *P. hispida*. *Verrucaria calciseda* and *Dermatocarpon miniatum* are both to be found on limestone, but in damp shaded situations not favorable to the growth of the common associations.

## SOIL OF MOIST WOODS

The soil of moist woods furnishes a habitat for the *Cladonia* association in which *Cladonia pyxidata* is usually dominant. *Peltigera canina* often appears but never in sufficient numbers to dominate. The association is: *Cladonia pyxidata*, *Cl. apodocarpa*, *Cl. cariosa*, *Cl. foliacea*, *Cl. bellidiflora*, and *Cl. fimbriata*.

## SOIL OF DRY, ROCKY, WOODED HILLS

*Cladonia furcata* var. *racemosa* is usually the dominant species found on the dry, rocky, wooded hills. The association is: *Cladonia furcata* var. *racemosa*, *Cl. furcata* var. *pinnata*, *Cl. alpestris*, *Cl. cristatella*, and *Cl. pyxidata*.

## SOIL OF GLADES AND ABANDONED FIELDS

The soil of glades and abandoned fields does not support a very abundant lichen flora. There was no locality in which it was possible to consider the lichens an association. *Cladonia pyxidata* is the most common species. *Dermatocarpon rufes-*



*cens* occurs frequently in small raised clumps. *Synechoblastus fascicularis* is also occasionally found but never in abundance.

#### BEDS OF SEASONAL WATER COURSES

The rocky beds of water courses which carry water only after rains furnish a habitat for an association in which *Lecidea cinnabarina* is usually dominant. The association is: *Lecidea cinnabarina*, *L. turgidula*, and *Verrucaria calciseda*.

#### TRUNKS OF TREES IN DRY SUNNY WOODS

The trunks of trees in dry, sunny woods support the most varied lichen flora of the entire region. There may be a colony of only one species or an association of as many as fourteen species on the same tree trunk. The most common association is: *Parmelia rudecta*, *P. Borerri*, *Physcia astroidea*. In the prairie sections of Boone, Cole, and Johnson Counties it is: *Parmelia rudecta*, *P. hypotropa*, *Caloplaca microphylla*, *Xanthoria parietina*, *Physcia astroidea*, and *Pertusaria marginata*.

#### SHADED TREE TRUNKS

The lichen flora of the shaded tree-trunks is generally meagre. The lichens associated in this habitat are: *Graphis scripta*, *Lecidea flexuosa*, *Catillaria Laureri*, and *Pannaria rubiginosa* var. *lanuginosa*. On the bark of the trees there is usually a luxuriant growth of *Protococcus viridis*.

#### DEAD TREES AND OLD WOOD

The lichen flora of trees that have recently died is very similar to that of the living trees in the same locality. When wood such as dead trees, fences, and buildings remains for a considerable time without decay there are usually definite associations of lichens formed. The most common of these is: *Lecidea cinnabarina*, *Cladonia santensis*, *Cl. squamosa*, *Cl. fimbriata* var. *subulata*, and *Cl. fimbriata* var. *coniocraea*. *Lecidea cinnabarina* is the dominant form, and *Parmelia rudecta* occurs occasionally.



## DECAYING WOOD

Wood which is definitely rotting furnishes a habitat for a small *Cladonia* association: *Cladonia cariosa*, *Cl. cariosa* var. *cribrosa*, *Cl. delicata*, and *Cl. pyxidata*.

The species of lichens here presented are from approximately one thousand collections made in central Missouri from the ten following counties: Boone, Callaway, Cole, Franklin, Gasconade, Jefferson, Johnson, Lincoln, St. Louis, and Washington, during the years 1930 to 1937. All of these counties are on or near the northern border of the Ozark Plateau. The geological and physiographic description of this region is given by Marbut.<sup>3</sup>

## VERRUCARIACEAE

## VERRUCARIA SUBMURALIS Nyl.

Limestone ledges in open situations. Boone: Columbia, *Berry* 314; Rocheport, *Berry* 335; Johnson: Warrensburg, *Berry* 359.

## VERRUCARIA SORDIDA Fink

Limestone ledges in open situations. Jefferson: Rush Tower, *Berry* 437.

## VERRUCARIA NIGRESCENS Pers.

Limestone ledges in open situations. Boone: Columbia, *Berry* 245, 263, 274.

## VERRUCARIA NIGRESCENTOIDEA Fink

Limestone ledges in open situations. Boone: Columbia, *Berry* 246; Rocheport, *Berry* 339.

## VERRUCARIA CALCISEDA Lam. &amp; DC.

Limestone ledges in open situations. Boone: Columbia, *Berry* 291; Jefferson: Rush Tower, *Berry* 436; Festus, *Berry* 529; De Soto, *Berry* 451; St. Louis: Creve Coeur Lake, *Berry* 609; Ranken Estate, *Berry* 731; Washington: Big River, *Berry* 489.

## DERMATOCARPACEAE

## DERMATOCARPON MINIATUM (L.) Mann.

Surface of limestone rocks in moist, shaded localities. Boone: Columbia, *Berry* 215, 264, 311; Ashland, *Drouet* 382D; Franklin: Gray Summit, Mo. Bot. Gard. Arboretum, *Berry* 689, 714; Port Royal, *Hubricht* 795H; Jefferson: Rush Tower, *Berry* 455; Crystal City, *Hubricht* 784H; Festus, *Berry* 516; Lincoln: Chantilly, *Hubricht* 766H; St. Louis: Creve Coeur Lake, *Berry* 595.

## DERMATOCARPON MINIATUM (L.) Mann. var. COMPLICATUM (Lightf.) Th. Fries

On rocks in moist localities. Callaway: Fulton, *Bartley* 319B.

<sup>3</sup> Marbut, C. F. Physical features of Missouri. Mo. Geol. Surv. 10: 11-110. pl. 2. 1896.



*DERMATOCARPON RUFESCENS* (Ach.) Th. Fries

On soil and occasionally rocks in undisturbed places. Boone: Rocheport, *Berry* 321; Franklin: Gray Summit, Mo. Bot. Gard. Arboretum, *Berry* 672, 707, 757; Cutler 582C; Jefferson: Festus, *Berry* 535; Rush Tower, *Berry* 427, 458.

## PYRENULACEAE

*LEPTORHAPHIS EPIDERMIDIS* (Ach.) Th. Fries

Sandstone ledges in bed of seasonal water course. Franklin: Gray Summit, Mo. Bot. Gard. Arboretum, *Berry* 648.

*PYRENULA NITIDA* (Weig.) Ach.

Bark of trees. Boone: Columbia, *Berry* 310.

## CYPHELIACEAE

*CYPHELIUM TIGILLARE* Ach.

On fence posts and the bark of various species of trees. Boone: Columbia, *Berry* 76, 256, 267, 301.

## ARTHONIACEAE

*ARTHONIA COMPLANATA* Fée

Bark of trees in open woods. Lincoln: Chantilly, *Hubricht* 780H.

*ARTHOTHELIUM HALLII* (Tuck.) Zahlbr.

Bark of trees in open woods. St. Louis: Centaur Station, *Hubricht* 815H.

## GRAPHIDACEAE

*GRAPHIS EULECTRA* Tuck.

Bark of trees in open woods. Boone: Rock Bridge, *Berry* 224.

*GRAPHIS SCRIPTA* (L.) Ach.

On trees having smooth bark and in well-lighted situations. Boone: Columbia, *Berry* 297, 305; Rocheport, *Berry* 326; Franklin: Gray Summit, Mo. Bot. Gard. Arboretum, *Berry* 699; Port Royal, *Hubricht* 797H; Jefferson: Crystal City, *Hubricht* 824H; Johnson: Warrensburg, *Berry* 365; St. Louis: Ranken Estate, *Berry* 747.

## EPHEBACEAE

*EPHEBE LANATA* (L.) Vainio

On moist surface of limestone rocks and damp soil in shady places. Boone: Rock Bridge, *Berry* 211.

## PYRENOPSISIDACEAE

*THYREA PULVINATA* (Schaer.) Mass.

On the surface of limestone ledges in sheltered positions. Franklin: Gray Summit, Mo. Bot. Gard. Arboretum, *Berry* 662, 663.

## LICHINACEAE

*PTERYGIUM PETERSII* (Tuck.) Nyl.

On sandstone ledges and rocks. Jefferson: Festus, *Berry* 504.



## COLLEMACEAE

## SYNECHOBLASTUS FASCICULARIS (L.) A. L. Smith

On moist soil in sheltered locations. Franklin: Gray Summit, Mo. Bot. Gard. Arboretum, *Cutler 640C*; Port Royal, *Hubricht 798H*; Jefferson: Festus, *Berry 549*; St. Louis: Creve Coeur Lake, *Berry 611, 613, 638*.

## COLLEMA FURVUM (Ach.) DC.

On moist limestone rocks. Franklin: Gray Summit, Mo. Bot. Gard. Arboretum, *Berry 664*.

## COLLEMA GRANOSUM (Schreb.) Rabh.

On rocks in shaded places. Boone: Ashland, *Drouet 388D*; Johnson: Warrensburg, *Berry 387*.

## LEPTOGIUM SATURNINUM (Dicks.) Nyl.

On moist rocks. Jefferson: Crystal City, *Hubricht 784H*.

## PANNARIACEAE

## PANNARIA RUBIGINOSA (Thunb.) Del. var. LANUGINOSA (Hoffm.) Zahlbr.

On sheltered limestone ledges and the base of trees. Franklin: Gray Summit, Mo. Bot. Gard. Arboretum, *Berry 673, 679*; Jefferson: Rush Tower, *Berry 417, 456*; St. Louis: Ranken Estate, *Berry 731*.

## PANNARIA LURIDA (Mont.) Nyl.

Bark of trees in open woods. Franklin: Gerald, *Berry 568*.

## STICTACEAE

## STICTA FULIGINOSA (Dicks.) Ach.

Stone ledges of wooded bluffs. Jefferson: Crystal City, *Hubricht 820H*.

## STICTA QUERCIZANS Ach.

On moss-covered rocks and tree trunks. Boone: Columbia, *Berry 273*; Franklin: Gerald, *Berry 758*; Jefferson: Crystal City, *Hubricht 785H*; Festus, *Berry 533*.

## PELTIGERACEAE

## PELTIGERA HORIZONTALIS (Huds.) Baumg.

On moist moss-covered soil in woods. Boone: Columbia, *Berry 298*; Ashland, *Berry 234, Drouet 320D, 384D*.

## PELTIGERA RUFESCENS (Weis) Humb.

On moss-covered soil. Boone: Columbia, *Berry 303*.

## PELTIGERA CANINA (L.) Willd.

On moss-covered soil in open woods. Boone: Silver Fork, *Berry 346*; Columbia, *Berry 301*; Ashland, *Drouet 381D*; Franklin: Gray Summit, Mo. Bot. Gard. Arboretum, *Berry 643, 718*; Gasconade: Mt. Sterling, *Berry 554*; Jefferson: Festus, *Berry 512*; Rush Tower, *Berry 428*; Lincoln: Chantilly, *Hubricht 765H*.

## LECIDEACEAE

## LECIDEA CINNABARINA Fée

On limestone rocks in full sunlight. Franklin: Gray Summit, Mo. Bot. Gard. Arboretum, *Berry 710, 758*; Jefferson: Festus, *Berry 520, 536, 540*; Rush Tower, *Berry 424*; St. Louis: Creve Coeur Lake, *Berry 601*.



## LECIDEA TURGIDULA E. Fries

On sandstone ledges in open woods. Franklin: Gray Summit, Mo. Bot. Gard. Arboretum, *Berry* 721.

## LECIDEA TESSELLINA Tuck.

On limestone rocks in full sunlight. Boone: Columbia, *Berry* 238; Rochepoort, *Berry* 329, 337.

## LECIDEA AURICULATA Th. Fries

On limestone rock in glades. Jefferson: Crystal City, *Hubricht* 793H.

## LECIDEA FLEXUOSA (E. Fries) Nyl.

Bark of trees in open woods. Franklin: Gray Summit, Mo. Bot. Gard. Arboretum, *Berry* 652.

## CATILLARIA LAURERI Hepp.

Bark of trees in open woods. Washington: Big River, *Berry* 484.

## RHIZOCARPON CONCENTRICUM (Davies) Beltr.

On limestone and chert rocks. Boone: Columbia, *Berry* 313; Franklin: Gray Summit, Mo. Bot. Gard. Arboretum, *Berry* 683.

## RHIZOCARPON GEOGRAPHICUM (L.) Lam. &amp; DC.

On limestone rocks. Boone: Columbia, *Berry* 163; Ashland, *Drouet* 373D; *Henning* 232H.

## CLADONIACEAE

## CLADONIA ALPESTRIS (L.) Rabenh.

On soil of dry rocky hillsides. Boone: Columbia, *Berry* 366; Callaway: Fulton, *McVeigh* 376M; Montgomery: Mineola, *Rickett* 225R.

## CLADONIA MACILENTA Hoffm.

On soil. Jefferson: Festus, *Berry* 509.

## CLADONIA DIDYMA (Fée) Vainio

On soil in sheltered places. Jefferson: Festus, *Berry* 497.

## CLADONIA BELLIDIFLORA (Ach.) Schaer.

On soil of wooded hillsides. Boone: Columbia, *Berry* 266.

## CLADONIA CRISTATELLA Tuck.

On decayed wood and soil. Boone: Ashland, *Drouet* 372D; St. Louis: Ranken Estate, *Berry* 749.

## CLADONIA CRISTATELLA Tuck. var. DENSISSIMA Fink

On soil on sandstone bluffs. Jefferson: Festus, *Berry* 500.

## CLADONIA FURCATA (Huds.) Schrad. var. RACEMOSA (Hoffm.) Floerke

On soil of dry rocky hillsides. Boone: Columbia, *Berry* 282, 307, 316; Johnson: Warrensburg, *Berry* 204.

## CLADONIA FURCATA (Huds.) Schrad. var. PINNATA (Floerke) Vainio

On soil of dry upland woods. Gasconade: Mt. Sterling, *Berry* 827.

## CLADONIA SANTENSIS Tuck.

Decaying logs and soil in open woods. Jefferson: Rush Tower, *Berry* 421.

## CLADONIA CRISPATA (Ach.) Flot.

Decaying wood and soil of open woods. Boone: Columbia, *Berry* 248.

## CLADONIA SQUAMOSA (Scop.) Hoffm.

On soil and decaying wood. Boone: Ashland, *Drouet* 251D; Columbia, *Berry* 254, 281, 287, 288, 379; Rock Bridge, *Berry* 156.

## CLADONIA SQUAMOSA (Scop.) Hoffm. var. MULTIBRACHIATA (Floerke) Vainio

On soil of dry wooded hills. St. Louis: *Berry* 623.



- CLADONIA SQUAMOSA (Scop.) Hoffm. var. PHYLLOCOMA (Rabenh.) Vainio  
On sandy soil in open woods. Jefferson: Festus, *Berry* 496.
- CLADONIA DELICATA (Ehrh.) Floerke  
On old and decaying wood. Boone: Columbia, *Berry* 370.
- CLADONIA APODOCARPA Robbins  
On soil of dry upland woods. Callaway: Fulton, *McVeigh* 377M; Franklin: Gerald, *Berry* 581.
- CLADONIA CARIOSA (Ach.) Spreng.  
On soil of open woods. Jefferson: Crystal City, *Hubricht* 790H.
- CLADONIA CARIOSA (Ach.) Spreng. f. CRIBROSA (Wallr.) Vainio  
On soil of wooded hillsides. Jefferson: Rush Tower, *Berry* 430.
- CLADONIA PYXIDATA (L.) Hoffm.  
On soil of abandoned fields and open woods. Boone: Ashland, *Henning* 233H; Columbia, *Berry* 7, 236, 256, 281, 287, 289, 315, 343, 368; Jefferson: Crystal City, *Hubricht* 791H; Festus, *Berry* 495, 501; Seibert 513S; Rush Tower, *Berry* 426, 432, 439; Johnson: Warrensburg, *Berry* 199, 364; Washington: Big River, *Berry* 480, 481.
- CLADONIA FIMBRIATA (L.) E. Fries  
On soil and decaying wood. Boone: Ashland, *Drouet* 374D.
- CLADONIA FIMBRIATA (L.) E. Fries var. SUBULATA (L.) Vainio  
On soil and decaying wood. Boone: Columbia, *Berry* 242, 278, 309.
- CLADONIA FIMBRIATA (L.) E. Fries var. CONIOCRAEA (Floerke) Vainio  
On soil and decaying wood. Boone: Columbia, *Berry* 260, 262, 276, 280, 342.
- CLADONIA PITYREA (Floerke) E. Fries  
On soil in open woods. Jefferson: Festus, *Berry* 511.
- CLADONIA PITYREA (Floerke) E. Fries f. PHYLLOPHORA (Mudd) Vainio  
On soil of dry wooded hills. St. Louis: Valley Park, *Berry* 634.
- CLADONIA FOLIACEA (Huds.) Schaer.  
On soil of dry wooded hills. Jefferson: Crystal City, *Hubricht* 789H; Rush Tower, *Berry* 420, 454, 457; Lincoln: Chantilly, *Hubricht* 781H; St. Louis: Valley Park, *Berry* 622, 632, 636; Washington: Big River, *Berry* 485.
- CLADONIA CAESPITICIA (Pers.) Floerke  
On soil and decayed wood. Boone: Columbia, *Berry* 171.

## ACAROSPORACEAE

- BIATORELLA FOSSARUM (Nyl.) Th. Fries  
On bark at the base of trees in open woods. Cole: Jefferson City, *Berry* 553.
- ACAROSPORA CITRINA (Tayl.) Zahlbr.  
On rock ledges in open situations. Boone: Columbia, *Berry* 247.
- ACAROSPORA GLAUCOCARPA (Ach.) Koerb. var. VERRUCOSA (Anzi) Magn.  
On soil at the top of limestone bluffs and in undisturbed glades. St. Louis: Creve Coeur Lake, *Berry* 605.

## PERTUSARIACEAE

- PERTUSARIA MULTIPUNCTA (Turn.) Nyl.  
Bark of trees in well-lighted woods. Boone: Columbia, *Berry* 304; Franklin: Gerald, *Berry* 563, 571; Gasconade: Mt. Sterling, *Berry* 558; Lincoln: Chantilly, *Hubricht* 774H.



## PERTUSARIA VELATA (Turn.) Nyl.

Bark of trees in open woods. Franklin: Gerald, *Berry* 561.

## PERTUSARIA TETRATHALAMIA (Fée) Nyl.

Bark of trees in open woods. Johnson: Warrensburg, *Berry* 832; St. Louis: Ranken Estate, *Berry* 735.

## PERTUSARIA PUSTULATA (Ach.) Duby

Bark of trees in open woods. Boone: Columbia, *Berry* 312.

## PERTUSARIA LEIOPLACA (Ach.) Lam. &amp; DC.

Bark of trees in open woods. Jefferson: Crystal City, *Hubricht* 825H.

## PERTUSARIA MARGINATA Nyl.

Bark of trees in open woods. St. Louis: Centaur Station, *Hubricht* 814H.

## PERTUSARIA PERTUSA (L.) Tuck.

Bark of trees in open upland woods. Washington: Big River, *Berry* 486.

## LECANORACEAE

## LECANORA SAMBUCI (Pers.) Nyl.

Bark of trees. Washington: Big River, *Berry* 476.

## LECANORA PALLIDA (Schreb.) Rabnh.

Bark of trees. St. Louis: Centaur Station, *Hubricht* 800H.

## LECANORA MELANOPHTHALMA (Lam. &amp; DC.) Ramond

On limestone rocks in full sunlight. Jefferson: Crystal City, *Hubricht* 794H.

## LECANORA THAMNOPLACA Tuck.

On limestone rocks. Boone: Rocheport, *Berry* 339.

## LECANORA VERSICOLOR (Pers.) Ach.

On limestone rocks in the bed of seasonal streams. Boone: Columbia, *Berry* 306.

## LECANORA MURALIS (Schreb.) Rabnh.

On limestone rocks in full sunlight. Boone: Rocheport, *Berry* 331, 334.

## OCHROLECHIA TARTAREA (L.) Mass.

Bark of trees. Jefferson: Festus, *Berry* 507.

## LECANIA SYRINGEA (Ach.) Th. Fries

Bark of trees. Franklin: Gray Summit, Mo. Bot. Gard. Arboretum, *Berry* 688.

## LECANIA SYRINGEA (Ach.) Th. Fries var. DIMERA (Nyl.) Oliv.

Bark of trees. Franklin: Gray Summit, Mo. Bot. Gard. Arboretum, *Berry* 694.

## LECANIA PERPROXIMA (Nyl.) Zahlbr.

Limestone ledges. Lincoln: Chantilly, *Hubricht* 764H.

## CANDELARIELLA AURELLA (Hoffm.) Zahlbr.

Limestone ledges on open hillsides. Franklin: Gray Summit, Mo. Bot. Gard. Arboretum, *Berry* 703.

## PARMELIACEAE

## PARMELIA RUDECTA Ach.

Bark of trees and rarely on stones or old wood. Boone: Ashland, *Drouet* 392, 394, 395; Columbia, *Berry* 3, 203, 208, 217, 218, 221, 282, 384; Franklin: Gray Summit, Mo. Bot. Gard. Arboretum, *Berry* 448, 690, 693, 698, 708, 713;



Gerald, *Berry* 570; Jefferson: De Soto, *Berry* 463; Rush Tower, *Berry* 415, 416, 434, 435, 445, 449; Crystal City, *Hubricht* 787H; Lincoln: Chantilly, *Hubricht* 772H; St. Louis: Centaur Station, *Hubricht* 818H; Creve Coeur Lake, *Berry* 586, 591, 598, 599; Ranken Estate, *Berry* 750; Valley Park, *Berry* 618, 628; Washington: Big River, *Berry* 461, 462, 465, 466.

*PARMELIA BORRERI* Turn.

Bark of trees and occasionally on rocks. Boone: Ashland, *Berry* 352; Columbia, *Berry* 4, 5, 101, 103, 210, 219, 222, 347; St. Louis: Creve Coeur Lake, *Berry* 583, 588; Ranken Estate, *Berry* 736; Valley Park, *Berry* 629.

*PARMELIA HYPOTROPA* Nyl.

Bark of trees and on rocks. Boone: Columbia, *Berry* 231, 240; Rocheport, *Berry* 322, 399.

*PARMELIA PHYSODES* (L.) Ach.

Bark of trees in well-lighted woods. Boone: Columbia, *Berry* 102, 169.

*PARMELIA PERTUSA* (Schränk) Schaer.

Bark of trees and occasionally on rocks. Boone: Columbia, *Berry* 285, 390, 391.

*PARMELIA CETRATA* Ach.

Bark of trees, rarely on rocks. Boone: Columbia, *Berry* 201, 227, 340.

*PARMELIA SAXATILIS* (L.) Ach.

On rocks and the bark of trees, in well-lighted places. Boone: Columbia, *Berry* 300; Callaway: Fulton, *McVeigh* 385M; Franklin: Gray Summit, Mo. Bot. Gard. Arboretum, *Berry* 577, 644, 649, 653.

*PARMELIA FRONDIFERA* Merrill

Bark of trees. Boone: Ashland, *Drouet* 396D.

*PARMELIA SUBRUGATA* Nyl.

On bark of trees and rocks. Boone: Ashland, *Drouet* 408D; Columbia, *Berry* 397; Johnson: Warrensburg, *Berry* 398; Washington: Big River, *Berry* 471.

*PARMELIA PERFORATA* (Wulf.) Ach.

Bark of tree in open woods. Franklin: Gray Summit, Mo. Bot. Gard. Arboretum, *Berry* 676, 720; Gasconade: Mt. Sterling, *Berry* 557; Washington: Big River, *Berry* 471.

*PARMELIA SUBLAEVIGATA* Nyl.

On trees and rocks. Boone: Ashland, *Berry* 299, *Drouet* 404D.

*PARMELIA QUERCINA* (Willd.) Vainio

Bark of trees in upland woods. St. Louis: Ranken Estate, *Berry* 739, 742; Valley Park, *Berry* 625.

*PARMELIA COLPODES* (Ach.) Nyl.

Bark of trees. Franklin: Gerald, *Berry* 578; Gray Summit, Mo. Bot. Gard. Arboretum, *Berry* 691; Gasconade: Mt. Sterling, *Berry* 579.

*PARMELIA CAPERATA* (L.) Ach.

On bark of trees and rocks. Franklin: Gerald, *Berry* 575; Gasconade: Mt. Sterling, *Berry* 565.

*PARMELIA OLIVACEA* (L.) Ach.

Limestone ledges in open woods. Franklin: Gray Summit, Mo. Bot. Gard. Arboretum, *Berry* 754.



## USNEACEAE

USNEA FLORIDA (L.) Web.

On the bark of trees and rarely on rocks. Boone: Ashland, *Drouet 382D*, *407D*; Columbia, *Berry 285*; Washington: Big River, *Berry 829*.

## CALOPLACACEAE

CALOPLACA AURANTIACA (Lightf.) Th. Fries

Bark of trees. Boone: Columbia, *Berry 255*.

CALOPLACA MICROPHYLLINA (Tuck.) Hasse

Bark of trees in well-lighted situations. Boone: Columbia, *Berry 208*; Franklin: Gray Summit, Mo. Bot. Gard. Arboretum, *Berry 695, 722*; St. Louis: Creve Coeur Lake, *Berry 787*; Ranken Estate, *Berry 729*; Valley Park, *Berry 637*; Lincoln: Chantilly, *Hubricht 768H*.

CALOPLACA GALACTOPHYLLA (Tuck.) Zahlbr.

On limestone rocks. Boone: Ashland, *Berry 243*; Columbia, *Berry 306*; Rocheport, *Berry 330*.

## TELOSCHISTACEAE

XANTHORIA PARIETINA (L.) Th. Fries

On bark of trees in well-lighted situations. Boone: Columbia, *Berry 2, 9, 45, 200, 202, 223, 231, 409*.

XANTHORIA POLYCARPA (Ehrh.) Rieber

On bark of trees. Boone: Ashland, *Berry 349*; Columbia, *Berry 105*.

## BUELLIACEAE

BUELLIA PARASEMA (Ach.) De Not.

Bark of trees in sunny woods. Washington: Big River, *Berry 474*.

BUELLIA PUNCTATA (Hoffm.) Mass.

Bark of trees. Franklin: Gray Summit, Mo. Bot. Gard. Arboretum, *Berry 642*; St. Louis: Ranken Estate, *Berry 741*.

BUELLIA COLLUDENS (Nyl.) Arn.

Surface of stones in full sunlight. Jefferson: Festus, *Berry 503*.

BUELLIA PULLATA Tuck.

Surface of stones in dry, well-lighted situations. Franklin: Gray Summit, Mo. Bot. Gard. Arboretum, *Berry 658*.

RINODINA KENTUCKYENSIS Fink

Surface of sandstone rocks and ledges. Jefferson: Festus, *Berry 493, 517*.

RINODINA ATERRIMA Krempelh.

Surface of limestone rocks. Jefferson: Rush Tower, *Berry 833*.

## PHYSICIACEAE

PYXINE SOREDIATA (Ach.) E. Fries

Bark of trees. Jefferson: Rush Tower, *Berry 444*; DeSoto, *Berry 450*; St. Louis: Creve Coeur Lake, *Berry 584, 589*; Valley Park, *Berry 616, 617, 626*; Washington: Big River, *Berry 468, 584, 589*.



*PHYSCIA ADGLUTINATA* (Floerke) Nyl.

Bark of trees in sunny woods. Boone: Ashland, *Berry* 109; Columbia, *Berry* 244, 403; Cole: Jefferson City, *Berry* 552; St. Louis: Centaur Station, *Hubricht* 816H.

*PHYSCIA TERETIUSCULA* (Ach.) Lynge

On rocks and occasionally on the bark of trees. Franklin: Port Royal, *Hubricht* 826H; Gasconade: Rosebud, *Berry* 564.

*PHYSCIA CAESIA* (Hoffm.) Hampe

On bark of trees in open woods. Boone: Ashland, *Drouet* 402D; Columbia, *Berry* 400; Rocheport, *Berry* 328; Johnson: Warrensburg, *Berry* 615.

*PHYSCIA ASTROIDEA* (Clem.) Nyl.

Bark of trees in well-lighted situations. Boone: Ashland, *Drouet* 401, 405; Columbia, *Berry* 4, 103, 105, 203, 216, 225, 389, 410; Rocheport, *Berry* 324; Jefferson: Rush Tower, *Berry* 423; Johnson: Warrensburg, *Berry* 228; St. Louis: Valley Park, *Berry* 618; Washington: Big River, *Berry* 831.

*PHYSCIA VIRELLA* (Ach.) Flagey

Bark of trees. Boone: Columbia, *Berry* 220, 261; Easley Post Office, *Berry* 205; Franklin: Port Royal, *Hubricht* 802H; Jefferson: Crystal City, *Hubricht* 823H.

*PHYSCIA ENDOCHRYSEA* (Hampe) Nyl.

On rocks and bark of trees. Boone: Rocheport, *Berry* 341; Franklin: Gray Summit, Mo. Bot. Gard. Arboretum, *Berry* 671.

*PHYSCIA LITHOTODES* Nyl.

On rocks and bark of trees in well-lighted woods. Franklin: Gray Summit, Mo. Bot. Gard. Arboretum, *Berry* 665, 667, 669.

*PHYSCIA STELLARIS* (L.) Nyl.

Bark of trees in well-lighted woods. Boone: Columbia, *Berry* 304; Cole: Jefferson City, *Berry* 830; Franklin: Gerald, *Berry* 572, 576; Gray Summit, Mo. Bot. Gard. Arboretum, *Berry* 668, 675; Gasconade: Mt. Sterling, *Berry* 568; Johnson: Warrensburg, *Berry* 614; Lincoln: Chantilly, *Hubricht* 776H; St. Louis: Valley Park, *Berry* 828; Washington: Big River, *Berry* 475, 477, 478.

*PHYSCIA PULVERULENTA* (Schreb.) Nyl.

On limestone ledges and rocks in open well-lighted woods. Boone: Ashland, *Drouet* 417D; Columbia, *Berry* 271, 275.

*PHYSCIA HISPIDA* Schreb.

On the surface of sandstone ledges in open upland woods. Franklin: Gray Summit, Mo. Bot. Gard. Arboretum, *Berry* 674, 728.

*PHYSCIA TRIBACIA* (Ach.) Nyl.

On bark of trees. Boone: Ashland, *Berry* 108; Columbia, *Berry* 1, 2, 104; Franklin: Gray Summit, Mo. Bot. Gard. Arboretum, *Berry* 706; St. Louis: Valley Park, *Berry* 620.

*ANAPTYCHIA HYPOLEUCA* (Mühlb.) Mass.

On bark of trees in open woods. Washington: Big River, *Berry* 473.